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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,384	01/13/2004	Takafumi Terahara	1460.1022D	9960

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EXAMINER	
PETKOVSEK, DANIEL J	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

CA

Office Action Summary	Application No.	Applicant(s)	
	10/755,384	TERAHARA ET AL.	
	Examiner	Art Unit	
	Daniel J Petkovsek	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *divisional filed January 13, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) *1,2,14,22-26 and 38* is/are withdrawn from consideration.

5)☒ Claim(s) *27-37 and 39-42* is/are allowed.

6)☒ Claim(s) *3,4,10,11 and 15-21* is/are rejected.

7)☒ Claim(s) *5-9 and 12-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *January 13, 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/13/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Brian Healy
Primary Examiner

DETAILED ACTION

This application is a divisional of US Patent 6,721,481 B2 (patent published April 13, 2004).

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The initialed prior art documents submitted by Applicant in the Information Disclosure Statements filed on January 13, 2004, have been considered and made of record (note attached copy of forms PTO-1449). It is noted that references AG, AM-AO, BM-BO, and CI-CN **have not been considered**, since these foreign and/or non-patent literature references were not scanned into the IFW system. These references need to be included in the response to this office action (along with a new PTO-1449 form) if they are to be considered in this application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 3, 4, 10, 11, and 15-18 are rejected under 35 U.S.C. 102 (e) as being anticipated by U.S.P. No. 6,731,837 to Goldberg et al.

5. Goldberg et al. U.S.P. No. 6,731,837 teaches (see Fig. 4a, column 9, line 65 through column 10, line 13) a distributed optical amplifying apparatus having non-linear optical effects comprising: a fiber line having 1st, 2nd, and 3rd fiber sections connected together such that the 1st, 2nd, and 3rd fiber sections have 1st, 2nd, and 3rd characteristic values, respectively, the second characteristic value being larger than the 1st and 3rd (see figure), since the effective cross section of the 2nd fiber section is smaller than the 1st and 3rd fiber cross sections, which clearly, fully meets Applicant's claimed subject limitations. Regarding claims 4, 10, and 11, see figure 4a. Regarding claim 15-17, the control for the amount of light pumped into the system is a processing means, as is the amplification and reception of the optical signals. Regarding claim 18, the system can use gratings (see Fig. 6b) for filtering/dropping means.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 3, 4, 10, 11, and 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.P. No. 6,424,774 to Takeda et al.

U.S.P. No. 6,424,774 to Takeda et al. teaches (ABS, Fig. 10, column 9 line 58 through column 10 line 67) an optical communication system comprising: optical transmission lines, a plurality of amplifying stations (column 10, lines 17-30) to ensure that the amplification is transmitted, repeated, and properly received, a pump light source, and an optical fiber having a DSF1, DSF2, and DSF3 sections that each have different characteristic values representative of

the non-linear refractive index divided by cross section of the fiber. Regarding claims 4, 10, and 11, see figure 10 for lengths. Regarding claim 15-17, the control for the amount of light pumped into the system is a processing means, as is the amplification and reception of the optical signals. Regarding claims 18 and 21, a passband filter is used to control which type of optical signals come into the apparatus.

Takeda et al. '774 does not *explicitly* teach that the middle (2^{nd}) optical fiber section has a characteristic value that is larger than both the 1^{st} and 3^{rd} sections. Takeda et al. '774 teaches the use of a plurality of different zero dispersion wavelength that are connected in the transmission path of the apparatus (see column 10), and any number of combinations of the specific properties of the non-linear fibers can be used. It would have been obvious at the time the invention was made to a person having ordinary skill in the art that Takeda et al. '774 implicitly suggests any combination (characteristic value of the non-linear fibers) can be used in the amplification system. It is reasonably suggested that DSF2 could have a higher non-linear refractive index than both DSF1 and DSF3 of Takeda et al. '774, for the purpose of having improved amplifying properties in the amplification module and being able to shorten the lengths of the fibers.

Allowable Subject Matter

8. Claims 27-37, and 39-42 are allowed. The following is a statement of reasons for the indication of allowable subject matter: the relevant prior art of record (US 6,424,774 to Takeda et al., US 6,731,837 to Goldberg et al.) does not explicitly teach or reasonably suggest, specifically in the device, that *Raman amplification* is resultant in the signal light as it passed through the fiber transmission lines.

9. Claims 5-9, and 12-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The relevant prior art of record does not teach or reasonably suggest wavelength dispersion/slopes in the negative ranges (claims 5-9), lengths of more than 50km in the fiber line, or the relative Raman on/off gain of between 0.5 to 1.

It is noted that using the system as claimed for specific Raman amplification purposes is viewed as unobvious by the Examiner to overcome the relevant prior art in this application.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art of nonlinear fiber sections in amplification systems: PTO-892 form reference B (Brother patent to same inventor)

11. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Daniel J Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Petkovsek
July 15, 2004

Brian Healy
Primary Examiner